



# **Brain and Learning**

**Dr. Saheleh kheirabadi**

**"Students Who Acquire Large Debts Putting Themselves Through School Are Unlikely to Think About Changing Society. When you Trap People in a System of Debt, They can't Afford the Time to Think."**

**Noam Chomasky**



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**In the Name of God**

# **BRAIN AND LEARNING**



















**Dr. Saheleh Kheirabadi**

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## PREFACE

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This book studies on investigated links between long term memory skills and student's abilities to learn the vocabulary of English language taught in class. Vocabulary is the basic level of any language and students attempt to learn English vocabulary by their cognitive strategies whenever they try to recall new words. Vocabulary is an indispensable part of the language learning process which it would be impossible to learn a language without learning vocabulary. The purpose of this book is to realize the relation between the left and right hemispheres on learning vocabulary. In this book we can look at the causes of long term memory and how students can improve it through many techniques such as, Microsoft Power Point, Imagination, Leitner box, Pictures and drawing. However, more students complain that they cannot remember words which have learned many times ago, for this reason the author proves that learning vocabulary in the second language for a long time is possible by utilizing the right hemisphere. In fact, the left hemisphere keeps information for a short time but the right hemisphere keeps data for a long time in the memory.

The aim of publish this book is to demonstrate that the relation between memory and language has remained poorly specified for many years. The learners learn English words a new language by their long term memory. The study's purpose was to examine how a teacher can encourage students to communication orally in class. Teachers need to create situations where students get the chance to speak and communicate with each other. Speaking

activities in the classroom are an important part of teaching English since they help students to develop their language and fluency when talking.

The brain includes left and right hemispheres. Broca's area of the left hemisphere not only is indeed the primary organ of language but also seems to underlie a broader range of cognitive powers that make humans unique. The left hemisphere keeps information for a short time but the right hemisphere keeps data for a long time in memory. In this book, the author wants to study the learning vocabulary in the second language for a long time is possible by utilizing the right hemisphere.

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## Literature Review

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There are various factors that contribute to the success of learning English as a second language (ESL). Microsoft PowerPoint presentations are one of the multimedia products that are widely used in a wide range of fields, with English language learning being one of them. Fisher (2003) suggests using presentation softwares for ESL teaching. Microsoft PowerPoint is a type of presentation software that allows users to show colored texts and images with simple animations and sounds. Ena (2001) says teachers may utilize pictures, words, shapes, motions, colors, and sounds into appealing combinations which stimulate students to begin the process of thinking and developing input and to produce output as a result. Presentation softwares enable teachers to show ideas dynamically (Moseley and Tliggins, 1999, p.9). This statement implies that to make media dynamic teachers may need the help of presentation softwares. Presentation softwares are an interactive technique which can help teachers to present lessons in lively and engaging ways (DFES, 2004, p.4). The use of Leitner's learning box in studying vocabulary for students led to a higher level of vocabulary improvement. One of the most challenging parts of language learning is the acquisition of vocabulary. Vocabulary is an intrinsic part of language teaching and learning. Vocabulary is essential for critical thinking, close reading, concise writing, and other skills (Levines, 2005). Rahimi and Sahragard (2008) remark that language learner's look for effective techniques to increase opportunities for retaining new words in long-term memory, but forgetting is a common

problem. Students complain that they cannot remember the words which they have learned. To solve this problem, educators attempt to include learning devices into their classes. Different studies show that the use of technology in schools has developed new ways of teaching and learning. It enhances learning by providing a better understanding of the topics as well as by motivating students.

Eggen and Kauchak (2004, p.414) stated that "research has identified positive effects of technology on motivation in at least four areas: self-esteem and self-efficacy, attendance, attitudes, and involvement".

One of the factors in second language learning is motivation. Nesamalar, Saratha, and Teh (1997, p.10) assert that it is "indisputable that motivation is an extremely important factor in successful language acquisition."

Blachowich and fisher (2000) have identified four principles of vocabulary instruction. They say that the students should personalize word learning. This principle is related to active development of vocabulary that demands actual use of new words in different contexts to conduct personal matters. The students themselves decide what word to learn and how to learn. The second principle needs immersing of the students in the learning of vocabulary. It means ongoing commitment for the vocabulary learning throughout the day in different forms. It is done when language isn't only exposed but explained to students. The third principle is based on the view that word building needs multiple exposure of different intensity. A single exposure isn't enough to develop rich understanding of vocabulary. It takes place in many steps over a period of time. Each exposure adds information how the word is used in different contexts. There is need of 12 exposures for getting mastery and proper utilization of new lexical items. The students must be provided opportunities to reflect on the learnt lexical item and to relate them with previous knowledge. There is also need to limit in the presentation of vocabulary in a lesson or the whole academic year. The massive exposure of vocabulary may confuse the students into use of

words in spoken and written form .The last principle emphasizes that the students should be active in learning of words. They should not be passive recipient in word knowledge. They should be encouraged to make connection between their learnt and previous knowledge. It allows the students to experiment with words in different ways.

Ellis (2001) described the type of memory used in second language learning. He proposed a working memory (WM) model, in which a supervisory attentional system (SAS) regulates information flow within the working memory. Ellis applied a constructivist approach to second language acquisition, which holds that general processes of human inductive reasoning lead to language learning. 'There is no language acquisition device specifiable in terms of linguistics universals, principles and parameters, or language specific learning mechanisms ' (Ellis, 2001, p.38).

Bates, Thal, and Marchman, as referenced by Ellis (2001), found that 'learners' language comes not directly from their genes, but rather from the structure of adult language, and from the constraints on communication inherent in expressing non-linear cognition into the linear channel provided by the human vocal-auditory apparatus' (p.38). Chunking is a major principle of human cognition. Its essence, which is bringing together a set of already formed chunks in memory and welding them together into a larger unit, represents a fundamental associative learning process occurring in all representational systems.

# Chapter 1

## Structure of the Brain



### Brain

The brain is one of the most complex organs in the human body. The human brain is responsible for so much more. It directs almost everything we do. It controls our movements and activities such as breathing, heartbeat, memory, speech, thoughts, and feelings. The mass of an adult human brain is approximately 1300 to 1400 grams. A new born human brain is about 350 to 400 grams. A normal human brain weighs about three pounds but its size belies its amazing capabilities. The brain contains an estimated ten billion neurons in the cerebral cortex and another ninety billion in the interior of the brain. The study could settle a long standing scientific debate about the relationship between brain size and intelligence.

Ever since the German anatomist and physiologist, Frederick Tiedemann, wrote in 1836 that there exists 'an indisputable connection between the size of the brain and the mental energy displayed by the individual man', scientists have been searching for biological evidence to prove his claim. The brain of Albert Einstein weighted 1230 grams, the brain of the German Mathematician Carl Friedrich Gauss Weighted 1492 grams, and the brain of the leading Poet of Russian Revolution, Vladimirovich Mayakovski, weighted 1700 grams. They had the



largest corpus callosum with more connections between the two hemispheres. The brain is divided into the left and right cerebral hemispheres. Each of these hemispheres has an outer layer of grey matter, the cerebral cortex, which is supported by an inner layer of white matter. Every animal including mammals, birds, reptiles, fish, and amphibians can have a brain. But the human brain is unique. Although it is not the largest, it gives us the power to speak, imagine, and solve problems. It is truly an amazing organ.

All human beings are unique, because each of us has a unique brain. The experiences and learning that we have cause physical and chemical changes in the brain. Since no two humans have had identical experiences, everyone's brain is somewhat different from that of every other person in the world (Whitaker, 1984). The operations performed by the brain can be divided into three levels: the primal, emotional, and rational (Grady, 1984). The primary mind enables humans to perform needed functions at a subconscious level while freeing the brain to concentrate on other processes that require conscious attention. The emotional mind makes it possible for humans to feel as well as to think. The rational mind processes ideas and produces language. Ideally, both the rational and emotional minds function together, although the thinking mind should control the feeling mind (The Brain, 1984). Every person has only one brain. However, the cerebral hemispheres are divided right down the middle into a right hemisphere and a left hemisphere. Each hemisphere appears to be specialized for some behaviors. The hemispheres communicate with each other through a thick band of 200-250 million nerve fibers called the corpus callosum (A smaller band of nerve fibers called the anterior commissure also connects parts of the cerebral hemispheres.).

As you probably know, about 90% of the population is right-handed. They prefer to use the right hand to write, eat, and throw a ball. Another way to refer to people who use the right hand is to say that they are right-hand dominant. It follows that most of the other 10 % of the population is left-handed or left-hand dominant. There are few people who use each hand equally; they are “ambidextrous”.



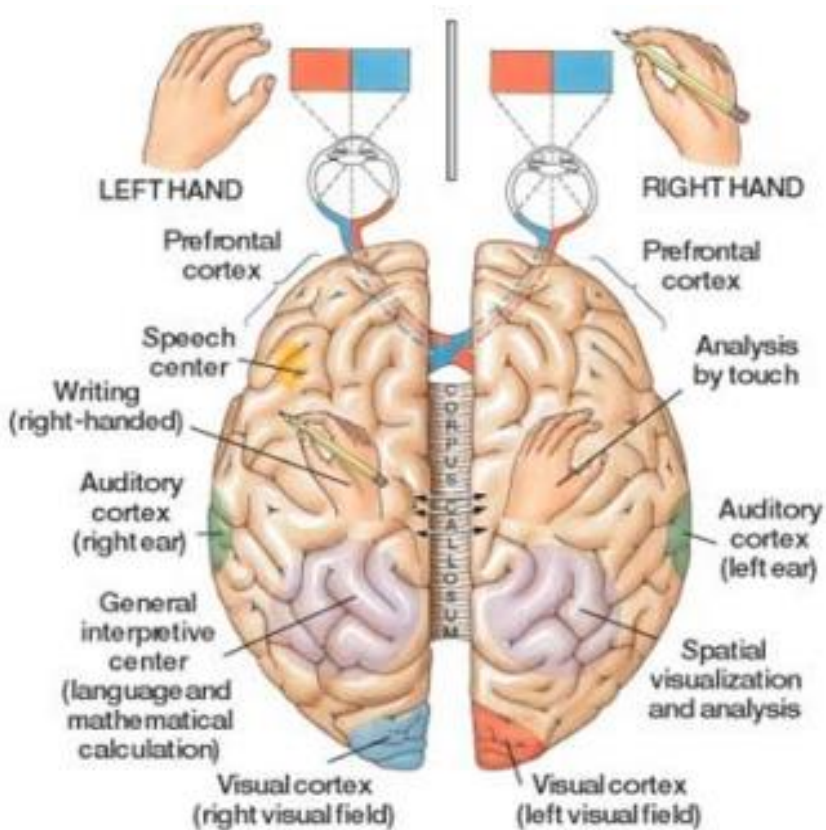
## Structure of the Brain

The brain is the center of the nervous system in all vertebrate and most invertebrate animals. Some primitive animals such as jellyfish and starfish have a decentralized nervous system without a brain. While sponges lack any nervous system at all. The human brain is a special zed organ that is ultimately responsible for all thoughts and movements that the body produces. The brain is made up of nerve cells which interact with the rest of the body through the spinal cord and the nervous system.

Each hemisphere of the brain is dominant for some behaviors. For example, it appears that the right brain is dominant for spatial abilities, face recognition, visual imagery, and music. The left brain may be more dominant for calculations, math, and logical abilities. Of course, these are generalizations and in normal people, the two hemispheres work together, are connected, and share information through the corpus callosum. Much of what we know about the right and left hemispheres comes from studies in people who have had the corpus callosum split – this surgical operation isolates most of the right hemisphere from the left hemisphere. This type of surgery is performed in patients suffering from epilepsy. The corpus callosum is cut to prevent the spread of the "epileptic seizure" from one hemisphere to the other.



## Left and Right Handedness and Language Processing



It was the French physiologist Paul Broca in the 1860s (as well as his less well-known countryman and near contemporary, Marc Dax, almost 30 years earlier) who noted that, at least in general terms, a person's handedness tends to indicate a specialized hemisphere on the brain's opposite side, so that a right-handed person probably has a left-hemisphere language specialization, and vice versa. Indeed, for almost a century, until the Wada test (a technique involving the anaesthetizing of one side of the brain using a drug such as sodium metal or sodium am barbital) was introduced in the 1960s, a person's handedness was just about the

only clue an operating neurosurgeon had about which hemisphere of a patient's brain was probably the one specialized for language. Following Broca's findings, it was initially assumed that handedness and the hemispheric dominance of speech processing were inextricably and intimately connected. However, it soon became apparent, even to Broca, that exceptions and mismatches existed, and that perhaps the association was not as fixed as he had initially thought. Although the incidence of right-hemisphere language dominance does increase more or less linearly with the degree of left-handedness, it turns out to be not quite as simple as that.

In fact, after the work of Springer and Deutsch, Damasio and Damasio, and others in the 1990s, we now know that, although about 95% of right-handers do have left-hemisphere dominance for language functions, only around 19% of left-handers have right-hemisphere language dominance, with another 20% or so processing language functions in both hemispheres (the incidence of language distribution in ambidextrous people is broadly similar to that found in left-handed people). Other studies report percentages for left-handers of 70%, 15%, and 15% (rather than 61%, 19%, and 20%), but the findings all suggest that, perhaps unexpectedly, some 60%-70% of left-hander's process language in the left hemisphere, just like right-handers! Indeed, around 93% of all people have left-hemisphere language dominance.



## Parts of the Brain and their Functions

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### Cerebrum

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The cerebrum, which develops from the front portion of the forebrain, is the largest part of the mature brain. The cerebrum consists of the cerebral hemispheres and accounts for two-thirds of the total weight of the brain. The left hemisphere controls language and speech. The other hemisphere interprets visual and spatial information. The cerebral hemispheres consist of an inner

core of myelinated nerve fibres, the white matter, and an outer cortex of grey matter. The cerebrum fills up most of your skull. It is involved in remembering, problem solving, thinking, and feeling and also controls movement. The cerebral cortex is divided into four sections, called 'lobes': the frontal lobe, the parietal lobe, the occipital lobe, and the temporal lobe.

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### **Cerebellum**

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The cerebellum sits at the back of your head, under the cerebrum. It controls coordination and balance. The cerebellum (Latin for 'little brain') is a region of the brain that plays an important role in motor control. It may also be involved in some cognitive functions such as attention and language and in regulating fear and pleasure responses. The cerebellum is important for motor learning. Although the cerebellum is most understood in terms of its contributions to motor control, it is also involved in certain cognitive functions, such as language (neuroscience online).

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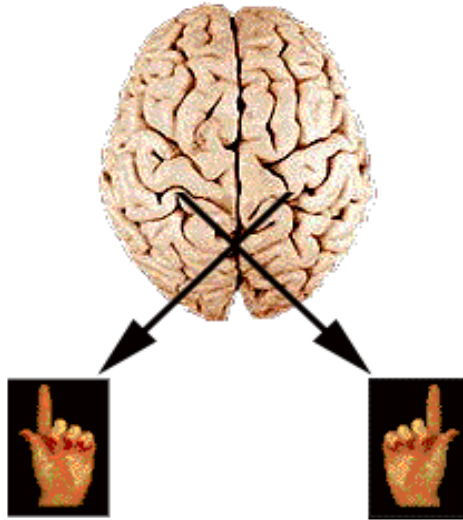
### **Brain Stem**

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The brain stem is the region of the brain that connects the cerebrum with the spinal cord. The brain stem controls several important functions of the body including: alertness, arousal, breathing, blood pressure, digestion, and heart rate. The brain, which has multi-level organized neurons, is divided wholly into grey and white matter. The two main differences between white matter and grey matter are biological and functional. White matter is responsible for transmitting instructions and information from the rest of the body into the grey matter. White matter is composed of fibrous axons and insulated with myelin sheeting. Grey matter is responsible for processing information, sends out instructions, and processes impulses transmitted by white matter. Grey matter is not fibrous, but composed of nerve cell bodies, which are uninsulated by myelin sheeting.

(enotes.com). Grey matter in the cerebellum is related to the processing of grammatical rules in a second language.

## Right Side - Left Side Hemispheres



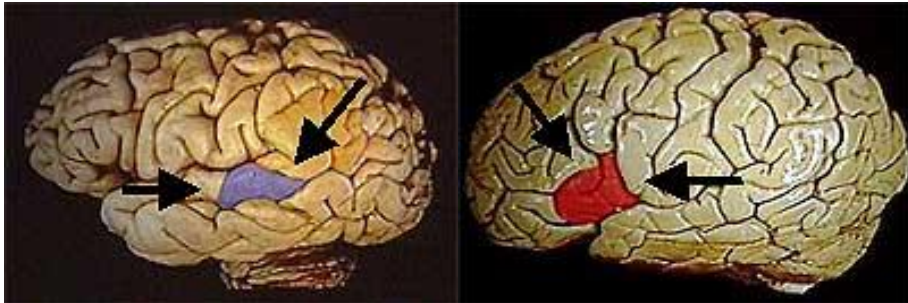
According to the theory of left-brain or right-brain dominance, each side of the brain controls different types of thinking. For example, a person who is ‘left-brained’ is often logical, analytical, and objective, while a person who is ‘right-brained’ is more initiative, thoughtful, and subjective. In psychology, the theory is based on what is known as the lateralization of brain functions. The right brain-left brain theory originated in the work of Roger W. Sperry, who was awarded the Nobel Prize in 1981. Sperry discovered that the corpus callosum connects the two hemispheres of the brain. The pop psychology notion of a left brain and a right brain does not capture their intimate working relationship. The left hemisphere specializes in picking out the sounds that form words and working out the syntax of the words, but it does not have a monopoly on language processing. The right hemisphere is actually more sensitive to the emotional features of language,

tuning in to the slow rhythms of speech that carry intonation and stress. It was the ancient Egyptians who first noticed that the left brain tends to control the right side of body and the right brain tends to control the left side of body. In 95% of right-handers, the left side of the brain is dominant for language. Even in 60-70% of left-handers, the left side of brain is used for language. Back in the 1860s and 1870s, two neurologists, Paul Broca and Karl Wernicke, observed that people who had damage to a particular area on the left side of the brain had speech and language problems. People with damage to these areas on the right side usually did not have any language problems.



## **Wernicke's and Broca's areas**

The two languages areas of the brain that are important for language now bear their names: Broca's area and Wernicke's area. Broca's area is one of the main areas of the cerebral cortex responsible for producing language. This region of the brain was named for French neurosurgeon Paul Broca who discovered the functions of Broca's area while examining the brains of patients with language difficulties. This brain area controls motor functions involved with speech production. Persons with damage to Broca's area of the brain can understand language but cannot properly form words or produce speech. This area is connected to another brain region known as Wernicke's area. This area is associated with processing and understanding language. Broca's area is located in the lower portion of the left frontal lobe. This area is responsible for functions of the body including: speech production and language processing.

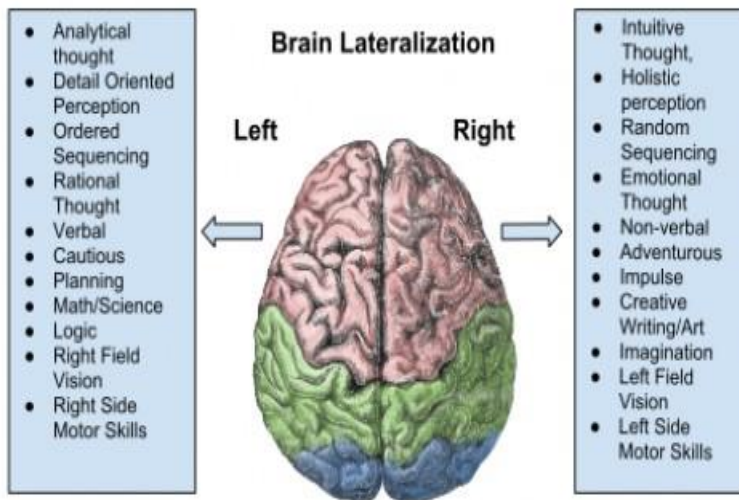


Wernicke's Area

Broca's Area



## Function of the Brain



**Left Hemisphere:** Language, Math, Logic.

**Right Hemisphere:** Spatial abilities, Face recognition, Visual imagery, Music.





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## Chapter 2

# Brains, Memories, and Learning

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### Human Learning

Learning and performance are essential parts of life. However, most types of learning and performance do not come naturally, but need high-quality instruction. In *The Master Psychology of Human Learning and Performance* you will discover how people optimally learn and perform, and which mechanisms are involved. Learning must be an active process because learning can occur only when a physical change takes place in the brain. Branford (1979) claims that, learners have to learn to formulate and to test hypotheses in order to learn. In this opinion, the most important task in learning is learning to learn. Individuals cannot learn unless their attention is focused on the material to be learned. Learning theorists have proposed a three-phase model of attention. First, individuals must arouse their attention and focus it on the appropriate material or task. Second, they must activate their attention with the objective of making a response. Third, they must take an effort to maintain their brain in an aroused and activated state until the learning task is complete (Wittrock, 1980). Nor can individuals learn unless they are able to comprehend the material to be learned. Comprehension depends primarily on learners rather than on the materials themselves.

Learners must have existing related information in their minds. Otherwise, they do not have the background to comprehend nor to store the material in memory. Even learners must be active participants in the learning Process. Bransford (1979, p.154) states, “comprehension involves active contributions on the part of the listener or reader.”

Another important component of human learning is the process of encoding incoming information in preparation for storage. Learning theorists divided learning into deductive and inductive learning. Deductive reasoning applies a general rule to particular instances while inductive reasoning involves inferences from the particular to the general. Language learning is most clearly deductive when a teacher gives an explicit statement of the rule, which the students then apply to examples. The term ‘inductive’ most obviously applies when a child learns its first language by including the rules from exposure to the language in use. A deductive approach is most clearly associated with the grammar-translation method of teaching languages, while an inductive approach is considered characteristic of audio-lingualism, where meaning and grammar were not explicitly explained but induced from carefully graded exposure to and practice with examples in situations and substitution tables. In the grammar-translation method, the focus on rules was conscious and explicit. In audio-lingualism, learning of the rules could be either conscious or unconscious depending on what the learner was thinking about. They were not explicitly formulated.



## **Brain-Based Learning**

By understanding how the brain works, educators are better equipped to help students with everything from focusing attention to increasing retention. That is the promise of brain-based learning which draws insights from neurology, psychology, technology, and other fields. Bringing this information to the

classroom can help teachers engage diverse learners, offer effective feedbacks that lead to deeper understanding, and create a rich learning environment that attends to student's social and emotional needs along with their developing brains. Chances are, you already know more about brain-based learning than you think you do. When you introduce topics to your students, do you begin by activating prior knowledge? That helps learners build on what they already know, strengthening connections in the brain. You use tools to help students; these tools get the brain primed for learning.

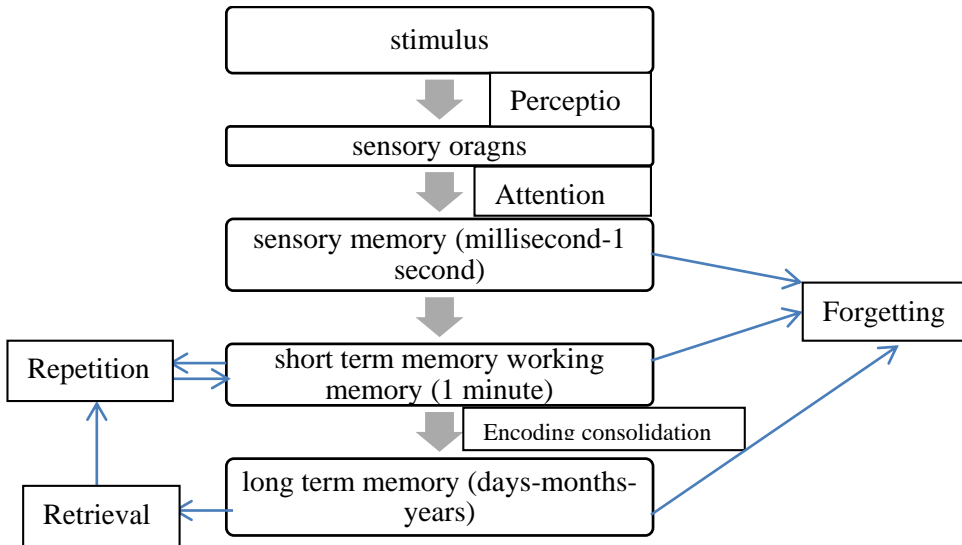
When students are feeling anxious or fearful, they are not in the mood to learn. That's because one part of the brain that processes emotions – the amygdala – responds to perceived threats by blocking information flow to the learning centers of the brain. Willis points to the following strategies for helping students, and their brains: feel comfortable; make the classroom stress-free; lighten the mood by making jokes and spurring curiosity; create a becoming and consistent environment through daily visuals, songs, or games; give students frequent opportunities to ask questions and engage in discussions without judgment; determine achievable challenges for each learner; encourage participation, not perfection – a classroom in which mistakes are encouraged is a positive learning environment, both neurologically and socially speaking. As cognitive neuroscientist and educational psychologist Mary Helen Immordino-Yang and Harvard doctoral candidate Matthias Faith write, students will allow themselves to experience failure only if they can do so within an atmosphere of trust and respect. Practice active listening and focus on what students are trying to say. According to Willis, this kind of positive reinforcement from the get-go allows students to let their guard down (known in neuro-speak as calming their affective filters). Listening to students in general and listening to their intentions in particular can help relax anxious brains. Although teachers cannot overcome every stress in a child's life they can take practical steps to make the classroom environment more conducive to top learning.

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## Long-Term Memory

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When we encounter material and information gathered by our senses, our working memory is the brief, immediate memory station that processes this current information. Working memory is also responsible for coordinating our ongoing mental activities, which allows us to keep information easily available. Once this information is rehearsed, it then becomes a part of our long-term memory. Long-term memory has a considerable capacity and contains all of our memories from the experiences and information we have accumulated over our life time. According to Margaret W. Matlin's book, *Cognition*, many psychologists would divide long-term memory into several subcategories, which are episodic memory (your memory for all events that have happened to you), semantic memory (your organized memory about the world, such as knowledge about words and other factual information), and procedural memory (your memory about how to do something). According to Craik and Lockhart's Article in 1972, long-term memory affects our perceptions of the world and influences what information in the environment we attend to. This deep processing is an essential aspect of how we should remember things. Our long-term memory provides the framework to which we attach new knowledge. Thus we want a strong network of connections and information to attach this new knowledge to.



## Long-term and Short-term Memory

Memory actually takes many different forms; we know that when we store a memory, we are storing information. But, what that information is and how long we retain it determine what type of memory it is. The biggest categories of memory are short-term memory (or working memory) and long-term memory, based on the amount of time the memory is stored.

There are two major categories of memory: long-term memory and short-term memory.

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### Long-term Memory

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Long-term memory is our brain's system for storing, managing, and retrieving information. Long-term memory refers to the continuing storage of information. In Freudian psychology, long-term memory would be called the pre-conscious and unconscious. This information is largely outside our awareness. Long-term memory is information that one remembers for a comparatively extended period of time. Along with short-term and working

memory, long-term memory helps explain why and how people remember. The amount of information which may be stored in the long-term memory is unknown. It is impossible to measure and may be limitless. The brain's ability to store information is greater than the world's most powerful computer memory.

Long-term memory was proposed by Julving (1972). He proposed a distinction between episodic, semantic, and procedural memory. Procedural memory is a part of the long-term memory which is responsible for knowing how to do things, i.e. memory of motor skills. It is not conscious (i.e. it's unconscious-automatic), though it is not declarative (for example, how to ride a bicycle).

Semantic memory is a part of the long-term memory responsible for storing information about the world. This includes knowledge about the meaning of words as well as general knowledge. For example, London is the capital of England. It involves conscious thought and is declarative.

Episodic memory is a part of the long-term memory responsible for storing information about events that we have experienced in our lives. It involves conscious thought and is declarative. An example would be a memory of our first day at school.

Long-term memories are more complex than short-term memory. We store different types of information (procedures, life experiences, language, etc.) with separate memory systems.

Explicit means something that is easily understood or told directly and clearly. Explicit memory or declarative memory is a type of long-term memory requiring conscious thought.

Implicit means something that is not expressed clearly, thus not understood clearly. Implicit memory is a major form of long-term memory that does not require conscious thought. It allows you to do things by rote.

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## Short-term Memory

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Short-term memory, also known as primary or active memory is the information we are currently aware of or thinking about. In Freudian psychology, this memory would be referred to as the conscious mind. The information found in short-term memory comes from paying attention to sensory memories. Most of the information kept in short-term memory will be stored for approximately 20 to 30 seconds, but it can be just seconds if rehearsed or active maintenance of the information is prevented. While many of our short-term memories are quickly forgotten, attending to this information allows it to continue on the next stage of long-term memory.

Psychologist George Miller suggested that people are capable of storing approximately four chunks or pieces of information in short-term memory. Short-term memory refers only to the temporary storage of information in memory. Short-term memory is a necessary step toward retention in long-term memory. The transfer of information to long-term memory for more permanent storage can be facilitated or improved by mental repetition of the information, or even more effectively, by giving it a meaning and associating it with other previously acquired knowledge.

Anderson (1980, P.163) defines short-term memory as “a capacity for keeping a limited amount of information in a special active state”. McDonough (1981) refers to short-term memory as working memory or speech processing memory. Hunt (1982) points out that short-term memory refers not to an area in the brain but to whatever the individual has in mind at any particular moment.

All knowledge that has to be presented for future use is stored in long-term memory. The brain cannot deal directly with material held in long-term memory. It must pull the data into short-term memory for processing, including that which will result in changes in the data itself, and later resubmit it to the long-term memory for continued storage. Schemata and scripts and decision making are theories of cognitive psychology for long-term



memory. Current learning theory holds that the brain organizes its information into related units called schemata.

Anderson (1980, p.129) defines a schema as “large, complex units of knowledge that organize much of what we know about general categories of objects, classes of events, and types of people”. The brain not only receives and/or generates information, but also it assembles it into organized and inter-related units.

Schemata that reflect typical sequences of actions are often referred to as script. For example, getting up in the morning, attending a church service, or going to a restaurant for dinner would normally involve a routine and expected sequence of actions that one normally associates with each of these activities.

Scripts account for the ability of individuals to predict what may happen in familiar situations, and they are an asset in the comprehension process in such situations as reading a story or understanding a listening passage (Anderson, 1980).

We make decisions to adjust our bodies, so we can sit comfortably at our desks to decide to answer a ringing telephone or to decide to sleep because we are tired and fatigued. Usually we do not consciously consider these issues as true examples of decision making. We only consider the problems that we have to spend substantial amount of time solving and weighing the consequences of as true instances of decision making. Schema therapy was founded by Jeffery Young and represents a development of cognitive behavior therapy (CBT) specifically for treating personality disorders.

Early maladaptive schema is described by Young as broad and pervasive themes and patterns made up of memories, feelings, sensations, and thoughts regarding oneself and one’s relationships with others. They are considered to develop during childhood or adolescence, be elaborated throughout life and to be dysfunctional in that they lead to self-defeating behavior. Examples include schemata of abandonment/instability, mistrust/abuse, emotional deprivation, and defectiveness/shame. Young focused on pulling from different therapies equally when developing schema therapy. The difference between cognitive-behavioral therapy and schema

therapy is that it “emphasizes lifelong patterns, affective change techniques, and the therapeutic relationship, with special emphasis on limited reprogramming.” He recommended this therapy would be ideal for clients with difficult and chronic psychological disorders.



## **Differences Between Woman’s Brain and Man’s Brain**

For centuries, the differences between men and women were socially defined and distorted through a lens of sexism in which men assumed superiority over women and maintained it through domination. The world is less interesting when everything is same. Men and women are equal but different. Equal means that men and women have a right to have equal opportunity and protection under the law, but they are at least as different psychologically as they are physically. Physical differences are rather obvious and most of these can be seen and easily measured; weight, shape, size. Men and women have different structures and wiring in the brain and they may also use their brains differently. The idea that men are from mars and women from Venus, with male and female brains wired differently, is a myth which has no basis in science, a professor has claimed.

Neuroscientist Prof. Gina Rippon, of Aston University, Birmingham, says gender differences emerge only through environmental factors and are not innate. The most obvious difference between the brains of men and women is overall size. Men’s brains are, on average between 10 and 15% larger than those of women. The man’s brain’s weight is an average of 1,378g, compared with 1,248g for women. Researchers show that some women’s brains are larger than the average whereas some men’s are smaller, but they are not related to differences in intelligence. Men and women’s brains also differ in overall composition. Male brains tend to have a slightly higher proportion of white matter, whereas those of females have a higher proportion of grey matter in most parts of the cerebral cortex. Consequently, the cortex is thicker in women’s brains than in those of men. There are also

sex differences in the size of individual brain structure. The hippocampus, a structure involved in memory formation, is on average larger in men than in women, as is the amygdala, which is also involved in memory, as well as in emotions.

Another sexual variation is found in a structure called the third interstitial nucleus of the anterior hypothalamus. Researchers show that it is twice as large in males as in females. Most people are intrigued by the thought processes of the opposite sex. Many men are sharply left-brain dominant, while women tend to be more evenly balanced between left and right brain processing. Women are therefore thought to be slightly more intuitive and sometimes better communicators. Men are often less socially adept, and are more task-oriented thinkers than females. Women are purported to have better communication skills and emotional intelligence than men. Women tend to be group-oriented, and apt to seek solutions by talking through issues. Men can have trouble picking up on emotional cues unless they are clearly verbalized making for tricky communications between the sexes. Females process language in both hemispheres, while males favor a single brain half.

In 2001, researchers from Harvard found that certain parts of the brain were differently sized in males and females, which may help balance out the overall size difference. The study found that parts of the frontal lobe, responsible for problem-solving and decision-making, and the limbic cortex, responsible for regulating emotions, were larger in women. [Source: Hoag]

Men also have approximately 6.5 times more grey matter in the brain than do women, but women have about 10 times more white matter than men do. [Source: Carey] This difference may account for differences in how men and women think.

Men seem to think with their grey matter which is full of active neurons. Women think with the white matter, which consists more of connections between the neurons. White matter is another reason why women's brains work faster. Some women even have as many as 12% more neurons as men do. [Source: Hotz] In

studying women's brain, physiologist Sandra Witelson found that those neurons were most densely crowded on the curtain layer of the cortex, namely the ones responsible for in and out of the brain. This, Witelson believed, may be one reason why women tend to score higher on tests that involve language and communication, and she comes to believe that these differences were present from birth [Source: Hotz]. But the density of women's neuron which is like the size of a guy's brain is not any sort of magic bullet for predicting intelligence. Scientists know this because they have conducted imaging studies on how men and women think. [Source: Kolata]

Women have an enhanced ability to recall memories that have strong emotional components. They can also recall events for experience that have similar emotions in common. Women are very adept at recalling information, event, or experience in which there is a common emotional theme. Men tend to recall event using strategies that rely on reconstructing the experience in terms of the elements, tasks, or activities that took place.

Estrogen and testosterone influence brain development, although the process of the way in which hormones and the brain interact to influence behavior is very complex. Louann Brizendine, MD, author of *The Female Brain*, points out that gender differences start before birth: female brains are flushed in uterus with estrogen hormones, while male brains are washed with testosterone.

Women are usually more concerned about how problems are solved than merely solving the problem itself. For women, solving a problem can profoundly impact whether they feel closer and less alone or whether they feel distant and less connected. The process of solving a problem can strengthen or weaken a relationship. Most men are less concerned and do not feel the same as women do when solving a problem. Men approach problems in a very different manner from how women do so. For most men, solving the problem presents an opportunity to demonstrate their competence, their strength of resolve, and their commitment to a relationship. How the problem is solved is not nearly as important as solving it effectively and in the best

possible manner. Men have a tendency to dominate and to assume authority in a problem-solving process.



## **What Happens in the Brain When You Learn a Language?**

Learning a foreign language can increase the size of your brain. This is what Swedish scientists discovered when they used brain scans to monitor what happens when someone learns a second language. The study is a part of a growing body of research using brain imaging technologies to better understand the cognitive benefits of language learning. Tools like magnetic resonance imaging (MRI) and electrophysiology, among others, can now tell us not only whether we need knee surgery or have irregularities with our heartbeat, but reveal what is happening in our brains when we hear, understand, and produce second languages.

The Swedish MRI study showed that learning a foreign language has a visible effect on the brain. MRI scans showed specific parts of the brains of the language students developed in size whereas the brain structures of the control group remained unchanged. Equally interesting was that learners whose brains grew in the hippocampus and areas of the cerebral cortex related to language learning had better language skills than other learners for whom the motor region of the cerebral cortex developed more. Looking at functional MRI brain scans can also tell what parts of the brain are active during a specific learning task.

Adult native speakers of languages like Japanese cannot easily hear the differences between the English 'r' and 'l' as distinct sounds. When presented with English words containing either of these sounds, brain imaging studies show that only a single region of a Japanese speaker's two different areas of activation show up, one for each unique sound. Early language studies based on brain research have shown that Japanese speakers can learn to hear and produce the difference in 'r' and 'l' by using a software program that greatly exaggerates the aspects of each sound that make it

different from others. When the sounds were modified and extended by the software, participants were more easily able to hear the difference between the sounds. Visible language creates a new world of objects, symbols, or letters, which have a lawful relationship to the sounds of speech. The mappings between symbols and speech have to be learned, and this learning has a lasting impact on the brain.



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## Chapter 3

# Brain, Stress, Learning

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### Stress and Child's Brain

The interesting part of the connection between stress and learning is that the prefrontal cortex of the brain is the area for paying attention, calming, and focusing as well as the area for short- and long-term memory. So, you need to focus in order to connect with your memory and connecting with memory enables children to take in new knowledge, because they need to attach it to something they already know. When a child does not have strategies to decrease anxiety, there is less attention available to grasp new ideas, think creatively, solve problems, and make good decisions. Also when children are upset, nervous, or angry and cannot manage their distressing emotions, they are not in an optimal zone for learning and retrieving information. They may know something for the tests, but they may not be able to access it. (Sharon Brock)

To get a sense of just what children are up against, it is useful to understand the physiological effects of stress on the brain. When a child experiences stress, the hypothalamus (above the brain stem) releases a hormone that rushes to the neighboring pituitary gland. The pituitary gland then mobilizes the production of a second hormone that swims via bloodstream to adrenal glands above the kidneys. The adrenal glands activate adrenaline and cortisol.



Adrenaline accelerates the child's heart rate and elevates the blood pressure. Cortisol pumps up the blood sugar level, elevating the child's muscle and memory power and boosting the pain threshold.



## **What Happens When the Brain is Stressed?**

Stress hormones end up swamping our bodies for days, weeks, months. Researchers show cortisol, specifically, chews up the brain if it loiters there over a long period. When lab rats in Israel, Germany, the USA, China, and Italy were given daily injections of rat cortisol for several weeks, their brain cells in their hippocampus region were killed, leaving them depressed, anxious, fearful, immature, needy, and unable to learn new behaviors (e.g. stuck in the same old "rat race"). In *Why Zebras Don't Get Ulcers*, Robert M. Sapolsky, a Stanford University professor of psychology, enumerated many ways that brain functions break down when subjected to chronic stress: "Hippocampal neurons no longer work as well," "neural networks get disconnected," "the birth of new neurons is inhibited," and "hippocampal neurons become endangered." In other words, brains under chronic stress will have trouble learning new things and committing new material to memory. But newer studies suggest it is not only extreme kinds of stress that can affect kids' ability to learn and think. In 2009, Virginia Polytechnic Institute State University scientists found that kids exposed to "household chaos" had lower IQ and more conduct problems. A joint study between Harvard Medical School/McLean Hospital and Catholic University of Korea in 2009 found that children who experienced maternal verbal abuse had lowered verbal IQs and less white matter in their brains. (White matter affects learning by coordinating communication between different regions of the brain.)



## Effects of Stress on Learning

Many stress models emphasize a "mismatch" between the individual and his or her environment. Both too little and too much stress inhibits learning. Stress is difficult to define because individuals react to it very differently and a situation that is stressful for one person may not be so for another. Further, stressed individuals vary widely in the effectiveness of their coping. Some college students, when stressed by academic demands, use ineffective mechanisms for coping. They may use "defensive avoidance"; for example, avoiding studying and putting off writing assignments. Teachers can help such students develop more effective mechanisms for coping through "stress inoculation" – managing their courses so that students have information about what to expect, giving feedback on their progress, and providing a degree of control over course activities. Feedback is information about current performance that can be used to improve future performance. When given properly, feedback can encourage positive stress which motivates students to take action and can discourage the negative stress which inhibits action.

Teachers can take specific steps to give effective feedback: (1) helping students know where they stand, (2) setting up "learning loops," (3) providing written comments on students' work, (4) testing often enough, and (5) arranging personal meetings to discuss students' work.

Having a personal sense of control is an important factor in reducing stress. When students do not know what to expect in their courses, they feel out of control. Teachers can help students have a greater sense of control by using requests rather than commands, giving students choices in course requirements, explaining assignments so that students know their purpose, involving students in the design of examinations, and soliciting and using feedback from students to improve courses and teaching. College teachers who can effectively use feedback and control in their classrooms create a climate ripe for learning. Students are relaxed but motivated to learn when they have an

instructor who provides direction and feedback and who is willing to accept it in return.

To improve their relationships with students and enhance students' learning, teachers can provide structure at the onset of a course, encourage class participation, get to know students by name, mobilize student tutors and study groups, use appropriate humor and persona stories, be "professionally intimate," be accessible outside class, develop advising skills, and be open to the role of mentor. In general, students feel less stressed and cope more effectively with stress if they feel they belong to the academic community. Faculty can play a key role in introducing and welcoming students to that community.



## **Teacher's Role in Reducing Learner's Stress**

While teachers are not therapists, they can be helpful to stressed students. By demonstrating friendly attributes, teachers can become aware when students are stressed and help them cope more effectively. Specifically, they might help students with stress reactions, maximize the outcome of meetings with students, recognize severe stress that warrants referral to professional mental health counselors, and disclose their own thoughts and feelings about the course work. Professors should keep in mind that the goal is not to eliminate all stress but to help students develop a variety of skills to cope with the negative aspects of stress. To assist students, the faculty can recommend a number of strategies: (1) improving study habits, (2) managing time wisely, (3) learning positive self-talk, (4) learning how to relax, and (5) joining a student support group.

If students try strategies for coping and still experience the negative aspects of stress, then the faculty should encourage students to seek professional counseling or therapy. This suggestion will more likely be received and acted upon if a good relationship between the teacher and the students already exists and if teachers are aware of what stress is.

According to Julia DeNeen, following some tips will give you some tools to create a relaxing learning environment and relationship.

Communication is the single most important thing you can do for your students. Create open channels for them to come to you for support, advice, counsel, etc. Instead of assigning homework every night, assign a packet of homework and let them decide when to complete the work. With extracurricular activities like sports and music, some nights it might be impossible to do homework without it impacting their sleep. This way they can catch up on the weekends or on a night with less to do. If you follow the above advice, it is important to go over how to manage their time with your students. Some kids will be overwhelmed with trying to divide and conquer a big project, so practice setting goals in the classroom so that it is more manageable for them at night.

At the beginning and end of the day, set aside five minutes for students to do a private meditation or imagery. Teach deep breathing exercises and give them time to relax their bodies and minds. It is so easy to get pulled into the present so intensely that you forget the bigger picture. Kids who get stressed out easily forget that the assignment they are pulling their hair out about is really quite small in the grand scheme of things. Offer a lighthearted tale about your failures as a student and help them to see the bigger picture. If a student flunks an exam or forgets an assignment but is normally quite reliable, take that into account. Everyone needs a "Get out of jail" free card once in a while. This may be tricky to execute fairly (especially if you have other students that consistently forget work), but you can create a system of passes. For example, every time a homework assignment is turned in on time, award the student a point. For every student that has banked 10+ points, they are given a free pass if they miss an assignment or do poorly on an exam.

Sitting in a chair listening to one person's voice is boring. The mind can wander in this setting. Worries and fears easily creep in when the atmosphere is not requiring all of their attention. Keeps the class moving through assignments, stations, and activities.

Chewing gum and doodling on notepads are two ways to relieve stress. You might find that students who are very nervous about an exam will do better if they have something like a piece of gum to chew on. Do not discourage doodling during lectures. It is a way to relieve pent-up energy and in some cases, can help with concentration.

Healthy food plays a big role in student stress. You cannot control what your students eat for breakfast and lunch, but you can offer incentives for healthy eating. In your classroom, award points for those who bring in vegetables, fruits, or healthy proteins like lean meat and eggs. When a student gets to a certain point level, offer a reward like a free homework pass.

Classical music is an excellent way to calm nerves. There should be time without music too, but during exams, meditation, or silent reading, turn on Bach!

Keep communication channels open with the parents of stressed out kids. Try to find out if there are other issues besides class work that are affecting him/her. If the parents are struggling too, a guidance counselor or social worker might be able to help the student cope with difficult life circumstances. Be your student's advocate whenever possible.

A relaxed teacher makes for a relaxed classroom. You need to do what you can to alleviate your own stress – be it through meditation, organization, or time of silent reading. We all need to recharge and you as the teacher set the whole tone of the classroom.

Teaching can be one of the most stressful careers. Normally, the stress does not come from the students that you are teaching, but from the before-school and after-school meetings and the overwhelming paperwork. As teachers, we have so many responsibilities and so little time to accomplish them. When we cannot complete our daily tasks and responsibilities, this can often translate into failure, stress, and teacher burnout.



## Ways to Reduce Teacher Stress

A teacher can reduce her /his own stress by following the guidelines given below:

1. Become aware of how you react in stressful situations.
2. Be positive, speak positive, think positive.
3. At the end of the school day, think about all the things you achieved and finished rather than what you did not have time to get done.
4. Learn to say NO to certain requests and after-school duties. You cannot do EVERYTHING, and you should not!
5. Understand and accept that a teacher is not a super hero and we do have limits. (Well, except for that crazy teacher in Kindergarten who stays until like 6 p.m. every night!)
6. Find a hobby and ways to relax at home.
7. Exercise regularly.
8. When you talk about your problems or issues regarding school, students, staff, and administrators, make sure you are not complaining, but rather trying to figure out a solution.
9. Use your time wisely. Evaluate how you spend your day, then make a weekly schedule and try to stick to it.
10. Set priorities and realistic goals.

Of all the activities that comprise the role of a teacher, classroom discipline is one of the most significant. In selecting an approach to classroom discipline, some teachers experience, and have to deal with, tensions arising from their desire to use educationally justifiable models while still quickly gaining and maintaining order in the classroom. This paper examines teachers' estimations of the stress that arises when they are unable to discipline students as they would ideally prefer. More importantly, the way teachers cope with any stress which does arise is documented using the Coping Scale for Adults. The results indicate that teachers who report more stress are those most interested in empowering their students in the decision-making process.



## How to Help a Child Learn?

Knowing how the brain works best allows teachers to create an environment that gives the student a higher probability of success in learning. Students have different learning styles. 50% are visual learners and prefer pictures, charts, and written texts over lectures. 30% are kinesthetic learners and need more tactile (hands-on) and movement-based activities. 20% are auditory learners and do best when they talk about what they are learning.

The brain performs better in a positive emotional state. Students must feel physically and emotionally safe before their brains are ready to learn. Teachers can create a positive environment by encouraging and praising their students' efforts. The brain learns new information in chunks. Brain research states that children between the ages of 5 and 13 learn best when given chunks of two to four pieces of information. Children aged 14 and older can learn up to seven chunks at a time. Teachers should plan for these limits and teach materials in small chunks. The brain also works on a time schedule. Children aged 5 to 13 learn best in five- to ten-minute increments. Children who are 14 and older learn in increments up to 10-20 minutes.

Sometimes, teachers may extend time limits through positive reinforcement. Children learn best when the teacher teaches the new material first and reviews previously learned material at the end of instruction. Students need time to practice the skills they are learning. Students need a moment to 'rest their brains from a task. For example, allow students to take time to stand up, provide a two-minute talk break, etc. By providing these moments, the brain will be more ready to stay on task and store information. Allow students to drink water during learning time. Research shows that dehydration causes higher salt levels in the blood which in turn raises blood pressure and stress. Dehydration also causes lethargy and loss of attentiveness. Students should drink 6 to 8 glasses of water a day to be properly hydrated. Provide time at the end of a lesson to drink and discuss the topic. Understanding

may not take place immediately; it may occur later. Processing time and reflection are vital to the learning environment (By Audrey Prince, M.Ed.).

Use television and computers sparingly. The American Academy Pediatrics recommends that children younger than two do not watch television at all and that children who are two and older view no more than two hours of quality programs a day, while some educational programs can be beneficial to kids. TV shows do not interact with or respond to children. These are the two catalysts kids need to learn a language. Computer games are interactive, but they are not responsive to a child's ideas. Treat ear infections thoroughly. Children in group child-care situations are more prone to ear infections, which can put them at risk for hearing loss and, consequently, language delays. If your pediatrician prescribes an antibiotic to treat an infection, make sure your child takes the correct dosage each day and uses it for the full prescribed time. When your child finishes the prescription, schedule a follow-up visit to your pediatrician to make sure the infection has been cleared.





## **Chapter 4**

# **Method and Instrument Teaching Vocabulary**



### **Vocabulary**

Vocabulary is an indispensable part of the English language learning process. It would be impossible to learn a language without vocabulary. It is the primary skill which should be mastered by the children before they acquire another language skill, such as listening, speaking, reading, and writing. It means that vocabulary plays an important role in both spoken and written communication. Rivers (1981) states that vocabulary can be presented, explained, and included in all kinds of activities, but it must be learned by the individual. Richards and Renandya say, "Vocabulary is a core component of language proficiency and provides much of the basis for how well learners speak, listen, read, and write." The problem may occur when the students do not master the vocabulary well. They will not be able to comprehend the content of the text if they have limited vocabulary knowledge. They cannot speak fluently either. Students complain that they cannot remember the words which they have learned. To solve this problem, we try to include learning devices into our classes.



## Instruments

There are some vocabulary learning strategies which can be used to improve students' vocabulary, like using authentic language, making creative activities, encouraging self-motivation, creating mental linkages, and doing memory strategies which are used to organize words like using flashcards, imagination, Microsoft PowerPoint, and Leitner's box (Schmidt and McCarthy, 1997). Long-term memory allows us to retain the material learnt over a long period of time. It has been noticed that in order to acquire long-term knowledge, you have to periodically come back and re-learn (or repeat) the material. In the early 70s, a German psychologist named Sebastian Leitner devised a learning system that makes selective learning possible with less effort than does the traditional method of studying a set of flashcards sequentially. Leitner's system consists of a cardboard box separated into a number of compartments. The compartments are filled with flashcards and the flashcards are moved from one compartment to another, according to the current level of knowledge. When a flashcard is answered correctly it is promoted to the next compartment. When a flashcard is answered incorrectly it is demoted to the first compartment.



## Leitner Box for Learning Vocabulary

In the research on the psychology of learning English vocabulary by Leitner box, a series of experiments with the goal to improve learners' long-term memory were carried out. Leitner used a physical box to store learners' flashcards. The box contained several compartments. Flashcards, which were new, were put into the first compartment. This compartment contained the flashcards, which were repeated every day. Flashcards that were correctly answered were moved to the second compartment. The repetition interval in the second compartment is set to two days. Flashcards

that are successfully answered in the second compartment are moved to the third one, etc.

Thus, Leitner's system can be summarized as follows:

Correctly answered flashcards move into the next compartment.

The higher the compartment is, the bigger is the repetition interval (in days).

Incorrectly answered flashcards are moved to the first compartment where the repetition cycle starts all over again.

The better you know the flashcards, the more infrequently you repeat them.

With the Leitner system, it is possible to separate the flashcards into distinct groups of your current retention potential. You spend the most time on learning and repeating the flashcards which you do not know well.

When a new piece of information is presented, human memory tends to forget it if it is not recalled in a certain time period. But if that piece of information is presented again, before being totally forgotten, the memory strengthens it and the retention period becomes greater. 48 hours after a study session, we generally forgot 75% of the presented material. This is one of the key points of the 'spaced repetition' method: each time we review a piece of information, our memory becomes stronger and we remember it for longer.

In 1972, a German science journalist named Sebastian Leitner wrote the book "How to learn to learn", a practical manual on the psychology of learning, which became a bestseller and popularized a new and simple method of studying flashcards. In the Leitner method (also known as spaced repetition learning technique or flashcards method), a box is divided up into a bunch of compartments. Each compartment represents a different level of knowledge. The result of the Leitner system is that you are allowed to prioritize your studying, focusing on the flashcards that are troubling you when you are keen and reviewing the easier flashcards when you want a lighter study session.



## Power Point as Learning Tool

PowerPoint presentations can be used in the classroom for initial teaching, for student projects, for practice and drilling, for games, for reviews, and for tests. This format is attractive to learners, and it appeals to learners' diverse learning styles, such as visual, auditory, kinesthetic, and creative by employing multimedia methods, such as sounds, images, color, action, design, and so on. Therefore, it is believed that Power Point presentations can improve the efficiency of English language in classroom instruction. In addition, they can help teachers organize their thoughts and present their information in an orderly, attractive manner and learners to better understand the instruction of the teacher. PowerPoint presentations is that instructors can have face to face communication with learners contrary to the conventional chalk board teaching where instructors often face the chalkboard with their back to the class. Then, the format of creating a title and bullet points on a PowerPoint slide helps learners identify main ideas and their supporting details and there by helps learners structure their thinking. Further, the strength of PowerPoint is its ability to allow an instructor to import graphics, audio, quotes, and music or to link to simulations or Web pages and thus create an enriching learning experience (Lanius, C,2004). PowerPoint can be used as a multimedia and interactive tool. Pictures, animation, Sound effects and music can greatly enhance the quality of the presentation. It is much easier to use attractive fonts, photos, clipart, tables, and graphs in PowerPoint. Instructors can use PowerPoint presentations to enhance the effectiveness of classroom instruction in many ways and in every subject area. Teachers can modify lessons and use them over and over again. Therefore, teachers save time on handing out instructional material, writing on blackboard, repeated speech and so on. ( Miltenoff ,2003). PowerPoint presentations by saying that merely flashing words or images on the slides won't make the content relevant if they are not on point. The audience gradually gets bored of the presentation if the content is not appropriately supported and enhanced. According to Keefe, D. D. and Willett, J.D. (2004),

classroom instruction should be driven by the curriculum and appropriate content and not by the lavish use of technology. Further, McDonald, K. (2004) argues that focusing on graphics, animations, or sound effects more than course content, classroom discussion, or effective communication is a pitfall of PowerPoint presentation (Tufte, E. 2003). Additionally, in this method, teachers do not need to write information on the blackboard, but just click the mouse. Therefore, it is very easy for teachers to give more information in one class, which can be difficult for learners to comprehend. What's more, learners are easily overwhelmed with a large amount of information given in the PowerPoint presentation.

Finally, it helps teachers communicate information more quickly, but do not necessarily help them analyze whether or not information is accurate, relevant, or current. The more information they have, the more important it becomes to learn critical analysis, visual literacy, and information literacy skills (p. 24) but PowerPoint presentations don't always comply with this.

For using this of PowerPoint while teaching, the teacher should create slides on the big screen and fill the entire space, but the computer used by the lecturer displays the slides in preview mode, with the space for notes visible at the bottom of the screen. In this fashion, lecturers can have a set of notes separate from what is displayed to the students, which has the overall effect of increasing the engagement of the presentation which explains how to configure the Presenter's Views.

**The teacher should Avoid reading in teaching by power point:** if your slides contain lengthy text, lecture "around" the material rather than reading it directly.

**Dark screen:** an effective trick to focus attention on you and your words is to temporarily darken the screen, which can be accomplished by clicking the "B" button on the keyboard. Hitting "B" again will toggle the screen back to your presentation.

**Navigate slides smoothly:** the left-mouse click advances to the next slide, but it is more cumbersome to right-click to move back one slide. The keyboard's arrow keys work more smoothly to go

forward and backward in the presentation. Also, if you know the number of a particular slide, you can simply type that number, followed by the ENTER key, to jump directly to that slide.



## Best Practices: Slideshow Construction

**Text size:** text must be clearly readable from the back of the room. Too much text or too small a font will be difficult to read.

Avoid too much text: one common suggestion is to adhere to the 6x6 rule (no more than six words per line, and no more than six lines per slide). The "Takahasi Method" goes so far as to recommend enormous text and nothing else on the slide, not even pictures, perhaps as little as just one word on each slide.

**Contrast:** light text on dark backgrounds will strain the eyes. Minimize this contrast, and opt instead for dark text on light backgrounds. Combinations to avoid, in case of partial color blindness in the audience, include red-green, or blue-yellow.

Transitions and animations should be used sparingly and consistently to avoid distractions.

**Template:** do not change the template often. The basic format should be consistent and minimal.

Use graphics and pictures to illustrate and enhance the message, not just for it being pretty or altercative.

Other ideas for use on a PowerPoint presentation include:

- ✓ Change font
- ✓ Shapes
- ✓ Clip art
- ✓ Images
- ✓ Charts
- ✓ Tables
- ✓ Transitions
- ✓ Animations
- ✓ Animating text or chart

Today, the English language classrooms have become smarter by the use of computer projection systems and interactive white boards. An interactive whiteboard is a large interactive display which connects to a computer projector. The projects on the computer desk top onto the board's surface where users control the computer using a pen, finger, or oder device. Such system allows users to make animated, interactive presentations with movement and video. Microsoft PowerPoint is such a software presentation technique that adds color, images, sound, animation and hyperlinks to other documents, including Web documents.



### **Imagination as a Learning Tool**

Imagination in this book is defined as the process of transforming an instructional design into students' inner images. Imagination enables people to go beyond actual experience and construct alternative possibilities in which a fragmented situation becomes a meaningful whole (Passmore, 1985). Individuals have the potential to make creative discoveries through their imagery. Therefore, imagination can be perceived as the basis for cultivating creative thinking and thus it is the driving force of innovation (Finke, 1996). Imagination effect involves mentally simulating the function and interaction of elements. Student learning is improved when they are instructed to imagine the processes covered in their study material. This phenomenon is called imagination effect. The imagination effect occurs when learners who imagine a procedure or concept perform better on a subsequent test than learners who study materials physically. Cognitive load theory predicts that information is more likely to be transferred from working memory to long-term memory under imagination conditions. Cognitive theory has been used to explain the effect by suggesting that when learners imagine information, they process the relevant schemas in working memory, which facilitates automation. It also suggests that the effectiveness of the imagination effect depends upon the number of cognitive elements contained in the problem and the



prior knowledge of the students. Mental practice is supposed to enable schema automation.

Valett (1983) indicated that children explore the world through playing. Colello (2007) also asserted that imagination allows one to explore, dare, challenge institutional order, and thus overcome limits. Intuition also has a place in human imagination. Betts (1916) held that imagination is an inventive power which allows the ability to see the old in new relations, and thus build new constructions out of old materials. People become expert when they develop schema automation for a number of processes in their field of specialization. At an expert level, people are able to select and use complex schemas and automated processes to reduce the cognitive load that arises during the processing of information in the working memory. The results of devising this tool indicated that imagination consists of several characteristics including productivity, transformation, sensibility, intuition, novelty, exploration, effectiveness, crystallization, and elaboration. The best tool for vocabulary learning is imagination. This tool can use comprehension words in learning the English language. For learning comprehension words, it is very easy to use imagination as a tool instead of definitions, explanations, or word meanings. Association and Imagination works help to extract what our mind has already stored. They just simply help us to get to and unlock that information more quickly. Research of this book has shown that self-imagining something from a personal perspective can be an effective strategy for helping students in learning English. Self-imagination can help students for improving long-term memory. Imagining things can be more fun for learners. It can also be used to put learners into a mind state that is more optimal for learning and doing.



## Pictures as Learning Tool

One often observed effect suggests that pictures and words do not share a common processing system: pictures are inevitably remembered better than words on tasks of recall and recognition (Park & Gabrieli, 1995, p.1593). This “picture superiority effect” is an “established memory phenomenon,” in that experiments have repeatedly shown that “memory for pictorial stimuli is extremely accurate, durable, and extensive compared to that for verbal stimuli” (Noldy, Stelmack, & Campbell, 1990, p.417).

A theory to explain why pictures are memorable says that the processing of pictures in the brain needs “additional allocation of attentional resources or effort” (Noldy, Stelmack, & Campbell 1990, p.418). Noldy, Stelmack, and Campbell’s (1990) EEG recordings of brain ERP (Event-Related Potential) waves showed that it took longer to name a picture than to read the verbal label of the picture. Park and Gabrieli’s (1995, p.1589) participants also named pictures more slowly than they read words. Investigations of elementary learning processes, such as free-association reactions to words, drawings, and objects, have since the 1940s found a longer reaction time to pictures than to words (Otto, 1962).

Pictures are more complex than the words that label the pictures, so more time and attention is needed to identify, or “name,” a picture. We spend more time looking at pictures (or real-life objects) before we can name them, so we remember pictures better. We spend less time looking at words in sentences, so we do not remember the sentences exactly—though we remember the gist. Pictures are also more distinctive and more unique than the words that label them, which further make pictures more memorable. Adults gain experience with reading words, so reading becomes faster and faster.

Gibson’s (1966) theory of cognitive-visual perception says that the information we perceive in the environment is so rich that we do not even have to process it. The environment explains itself and almost “tells” us what it is (Doerr 1999). When we see a chair, we understand its meaning without needing to name it. We

do, nonetheless, have to learn the meaning of the chair, its function or physical composition. As Ogasawara (1998) points out, “no one can understand the pictures(s) and/or figure(s) without any pre-concept or pre-learning.” While naming pictures is slower than reading words, pictures can be understood quickly when we do not need to verbalize what we are looking at.

This way of learning, by making connections between pieces of information and understanding their relationship, suggests that presenting pictures and words together so as to create connections between them will be similarly beneficial.

For adults, say Di Vesta, Ingersoll, and Sunshine (1971, p.478), the use of imagery is a strategy preference, while for children it is a skill. Teaching children to construct mental images as they read enhances their abilities to “construct inferences, make predictions, and remember what has been read,” say Gambrell and Brooks Jawitz (1993, p.265). Their study (Gambrell & Brooks Jawitz, 1993) showed that second- and fifth-graders who were told “Remember to make pictures in your head” outperformed the control group who were instructed to “Read to remember.” Mental imagery, they found, by encouraging an active engagement with the text, was even more effective than illustrations for reading comprehension, as the children recalled more story structures and wrote more complete stories.

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## Chapter 5

# Research, Data, and Analyzing Data

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### Research

This chapter explained about the Data Collection and also Analyzing Data of the study. The teacher tries to improve long term memory of learners for better vocabulary learning in English language. For the collection of data, the participants of the study were forty learners who are aged between 8\_11years. The researcher has divided the learners into two groups. To justify methods and techniques, the teacher divided learners into two groups .in group (A), the participants (10 males and 10 females) learned with a memory enhancing method. Researcher used of Leitner Box and Ppt for teaching vocabulary in the class. The instruments enhanced learner's long term memory and their attitude toward the class presentation and the instructor in English course while in group (B) the control group (n=20) was taught by using the traditional vocabulary teaching method.

Finally, researcher conducted multiple choice questions exam in the end of per month. The last result shows that the learners (A) class have significant progress on vocabulary learning rather than the learners (B) class. The analysis of data proves that using of these tools improving learner's memory in learning vocabulary for life time.

The research of this book has shown that learning is more effective when students give input into the vocabulary they need to learn. Elementary aged ELLs are usually visual or kinesthetic learners. When a teacher simply lectures, ELLs have very little understanding of the concepts being taught. It is therefore helpful to use realia, pictures, photographs, and power point. These tools helped students interpret meaning. So they had to draw simple pictures to show what the words meant. ELLs need ample opportunities to speak English and authentic reasons to use academic language. Working in small groups is specifically beneficial because ELLs learn to negotiate the meanings of vocabulary words with their classmates. When students work on the previously mentioned vocabulary activities in pairs or small groups, they can better understand and discuss the key concepts of the content area unit. Vocabulary is central to English language teaching because without sufficient vocabulary students cannot understand other or express their own ideas. For this reason, the teacher tries to improve student's long term memory by many tools in teaching English language. In this research a learner's education has been about learning English vocabulary. It has always included teaching in a period of three months.



## Data collection

**Table (1)**

Marks of Group (A) in the first Exam		
Sr. No.	Scores by Female Students	Scores by Male Students
1.	20	23
2.	25	18
3.	24	20
4.	23	22
5.	22	18
6.	24	23
7.	25	25
8.	22	22
9.	20	23
10.	25	25

The table (1) has shown the learners marks in the first exam. The researcher had prepared a module to teach vocabulary items over a period of one month. The teacher used Ppt, Imagination, pictures for teaching English vocabulary. The learners used the Leitner box for memory testing in class and out of the class. The teacher gave multiple question exams to them after one month of teaching and practice. The first exam paper was of included 25 questions and every question carried one mark. The learners had to answer all the questions in 30 minutes.

**Table (2)**

<b>Marks of Group (B) in the first Exam</b>		
<b>Sr. No.</b>	<b>Score by Female Students</b>	<b>Score by Male Students</b>
1.	23	24
2.	25	21
3.	22	23
4.	21	17
5.	24	22
6.	20	23
7.	22	18
8.	23	15
9.	15	19
10.	22	23

The table (2) shows marks of learners in the group (B) in the first exam after a month of teaching 60 words. The teacher used (GTM) for teaching the vocabulary in class. She translated words in their mother tongue language then they tried to memorize the words by spelling and writing. This method is an effective way for application of grammar and sentence structure and least stressful for students but they have less interest in learning English vocabulary. The grammar translation method is based on learning words and sentences by first language. A typical approach would be to present the rules of a particular item of grammar, illustrate its use by including the item several times in a text and practice using the item through writing sentences and translating it into the mother tongue.

**Table (3)**

<b>Marks of Group (A) in the Second Exam</b>		
<b>Sr. No.</b>	<b>Score by Female Students</b>	<b>Score by Male Students</b>
1.	24	21
2.	21	20
3.	19	21
4.	22	20
5.	24	21
6.	20	19
7.	21	15
8.	20	20
9.	18	18
10.	20	25

The learner's marks of group (A) in the second exam show on table (3). The learners continue learning vocabulary in class after the first exam. The teacher in group (A) focused on Ppt and imagination for teaching vocabulary because; she believes that learners should work with their long term memory for memorizing more words. In the second month they learned 60 new vocabulary that are why they had to remember 60 words which they learnt in the first month while they learnt 60 new words. Learners practiced by the Leitner box every day. This box helped them to remember the words for a long time. Long-term memory allows us to retail material learnt over a longer time. Long term memory allows us to retain material learnt over a long period of time. It has been noticed that in order to acquire long-term knowledge, you have to periodically come back and re-learn (or repeat) the material. The researcher administered another multiple choice exam for the learners after two months. This question paper included 25 questions out of 120 words which learners had to answer.



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**Table (4)**

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<b>Marks of Group (B) in the Second Exam</b>		
<b>Sr. No.</b>	<b>Score by Female Students</b>	<b>Score by Male Students</b>
1.	20	17
2.	22	16
3.	15	12
4.	18	16
5.	15	15
6.	13	22
7.	17	21
8.	16	19
9.	21	16
10.	17	20

The table (4) displays the learner's marks group (B) in second exam. The teacher further teaches 60 new words in group (B) for the second month. The learners learned English words by (GTM) method. The teacher is teacher centered and students are passive in the class. She taught by bilingual words lists, dictionary study, and memorization. Much of the words are devoted to translating words into and out of target language, and it is the focus on the words that is a distinctive feature of this method. The teacher took the second exam of learners group (B) after two months of teaching. The exam paper included 25 questions out of 120 words.

**Table (5)**

<b>Marks of Group (A) in the Third Exam</b>		
<b>Sr. No.</b>	<b>Score by Female Students</b>	<b>Score by Male Students</b>
1.	23	19
2.	20	20
3.	18	22
4.	25	20
5.	20	21
6.	24	22
7.	22	24
8.	23	20
9.	21	18
10.	18	17

**Table (6)**

<b>Marks of Group (B) in the Third Exam</b>		
<b>Sr. No.</b>	<b>Score by Female Students</b>	<b>Score by Male Students</b>
1.	15	12
2.	10	10
3.	12	19
4.	15	20
5.	13	15
6.	18	14
7.	20	12
8.	16	15
9.	22	12
10.	21	15

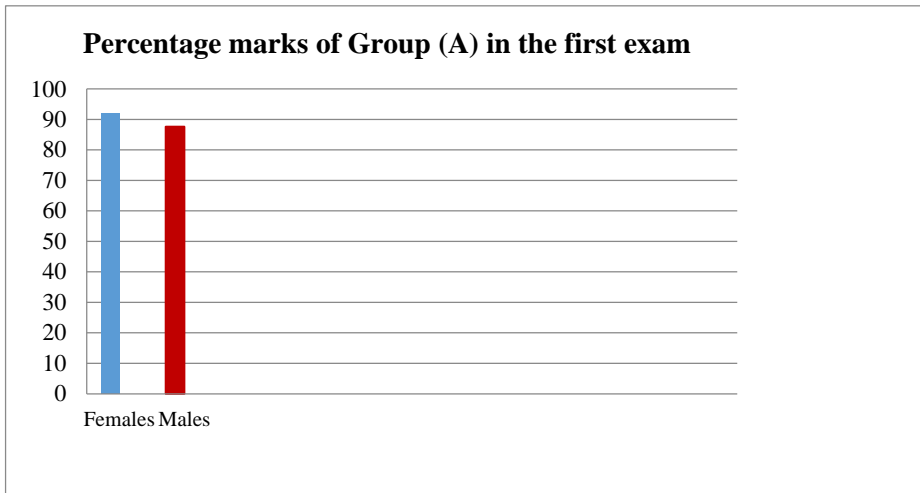
The table (5), (6) show the student marks after three months teaching. The teacher teaches 60 new words to learners in the third month. Learners group (A) learnt by the direct method and many instruments and learners group (B) learnt the vocabulary by (GTM). They learnt 180 words within three months. The Teacher took the third exam which included 25 questions out of 180 words after this period of time.

 **Analyzing Data**

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**Chart (1)**

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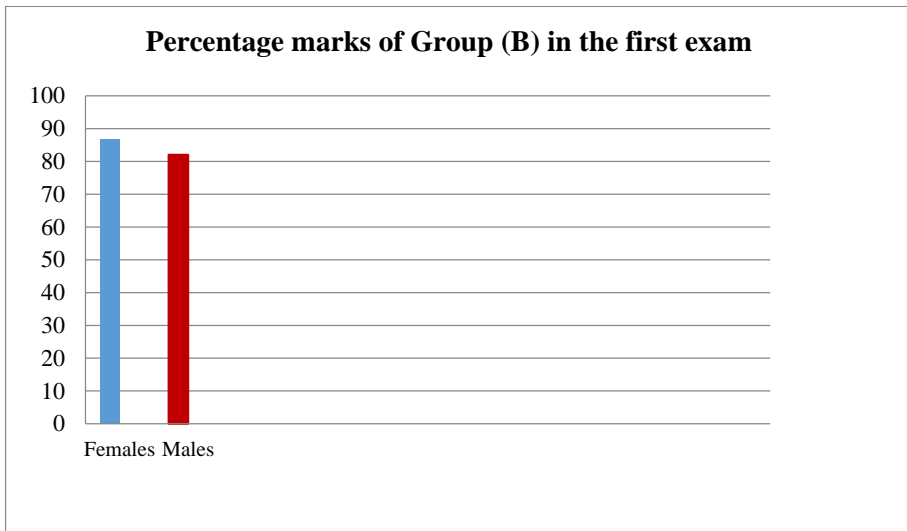


The chart (1) shows that the percentage of students teaching groups (A) in the first exam within a month. In this exam female students acquired 92% marks and male learners acquired 87.6% marks. This chart proves that percentages of female's marks were higher than the percentages of male's marks with minor differences in the first exam. We can see in this research that boys and girls are different. This test has shown us that the brains of men and women are different. Women often excel at language-based tasks for two reasons: two brain areas that deal with language are larger in females, and females process language in both hemispheres while males favor a single brain half. That is why the girls have obtained higher scores than the boys.

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**Chart (2)**

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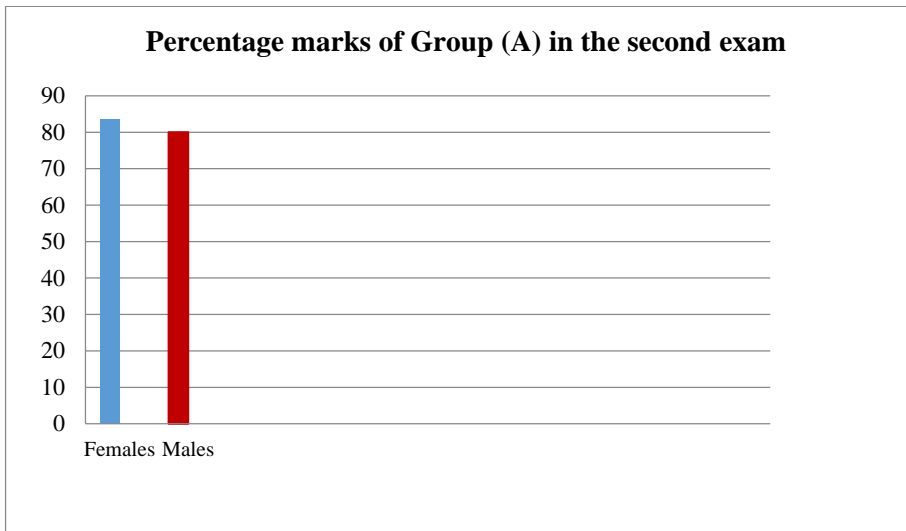


The percentage of students learning in the group (B) in the first exam has shown on chart (2). In this exam female students acquired 86.8% marks and male students have acquired 82% marks at the end of a month of teaching and practice on the vocabulary. This chart illustrated those female students acquired higher marks than male students. There is a nominal difference of marks between male and female learners in group (B). A number of structural elements in the human brain differ between males and females. Females often have a large hippocampus, our human memory center. Females also often have a higher density of neural connections into the hippocampus. As a result, girls and women tend to input or absorb more sensorial and emotive information than males do.

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**Chart (3)**

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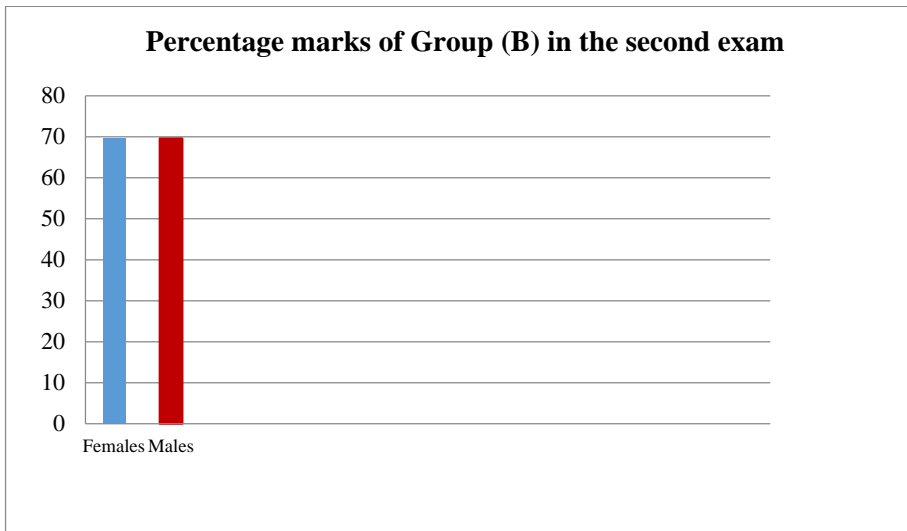


The chart (3) displays that percentage marks of learners marks in group (A) in the second exam. The females have acquired 83.6% and males acquired 80% marks after 8 weeks and 24 hours of teaching. This chart represents difference in learning between females and male learners. Almost most learners forget what they learn after a short period of time. The following graph shows an example (recalling ability vs. time): It is known that repetitions improve long term memory and words are not forgotten very soon. Fortunately, the intervals between consecutive reviews can be increased. Male brains utilize nearly seven times more gray matter for activity while female brains utilize nearly ten times more white matter. Gray matter areas of the brain are localized. They are information and action processing centers in specific splotches in a specific area of the brain. This can translate to a kind of tunnel vision when they are doing something. White matter is the networking grid that connects the brain's gray matter and other processing centers with one another. This profound brain processing difference is probably one reason you may have noticed that girls tend to more quickly transition between tasks than boys do.

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**Chart (4)**

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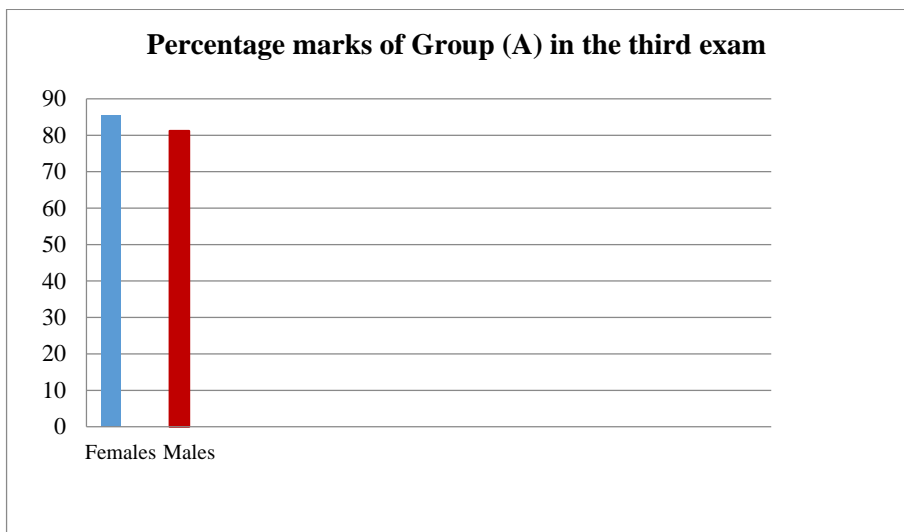


The chart (4) represents that female learners acquired 69.6% and male learners acquired 69.6% scores in eight weeks and in 24 hours of teaching 120 words as a second language. In this research, women scored well on attention, word and face memory and social cognition, while men performed better on spatial processing and sensory motor speed.

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**Chart (5)**

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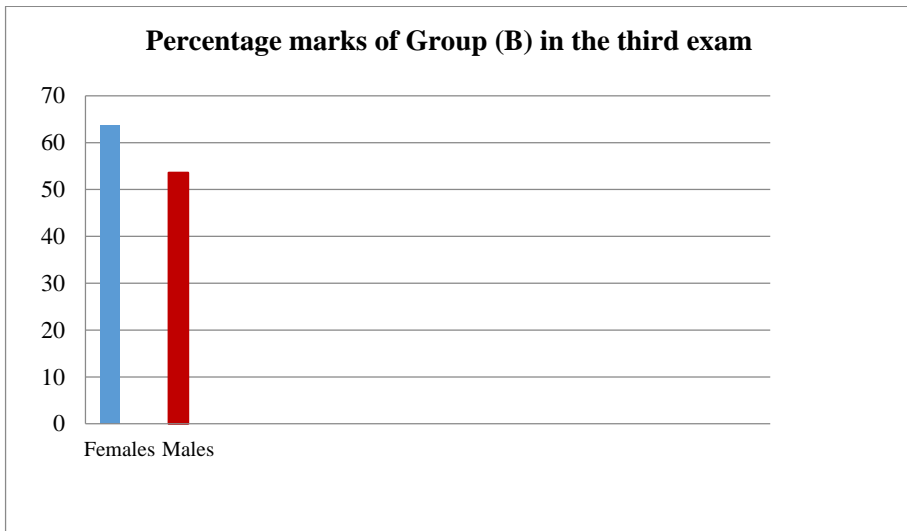


The chart (5) illustrated the learning percentages of learners in the third exam. The female students of group (A) acquired 85.6% and the male students of group (A) have acquired 81.2% scores in this exam.

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**Chart (6)**

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The chart (6) illustrated the learning percentages of learners of group (B) in the last exam. Female's learners of group (B) acquired 63.8% and male learners of group (B) passed with 53.6% scores in this exam. The chart (5) & (6) display that females are more successful in exams than males. Male brains appeared to be wired front to back, with few connections bridging the two hemispheres. These differences might explain why men, in general tend to be better at learning and performing a single task, like cycling or navigating, whereas women are more equipped for multitasking.



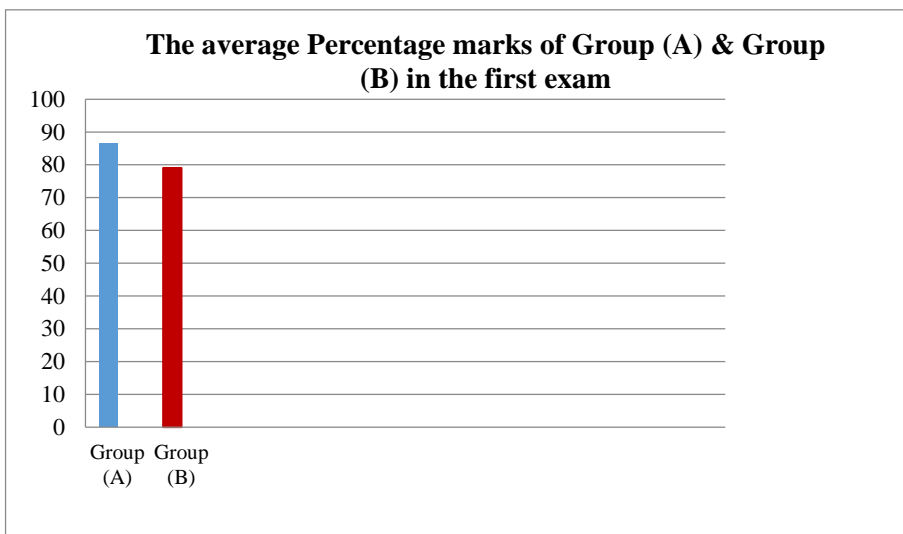


## Observations & Findings

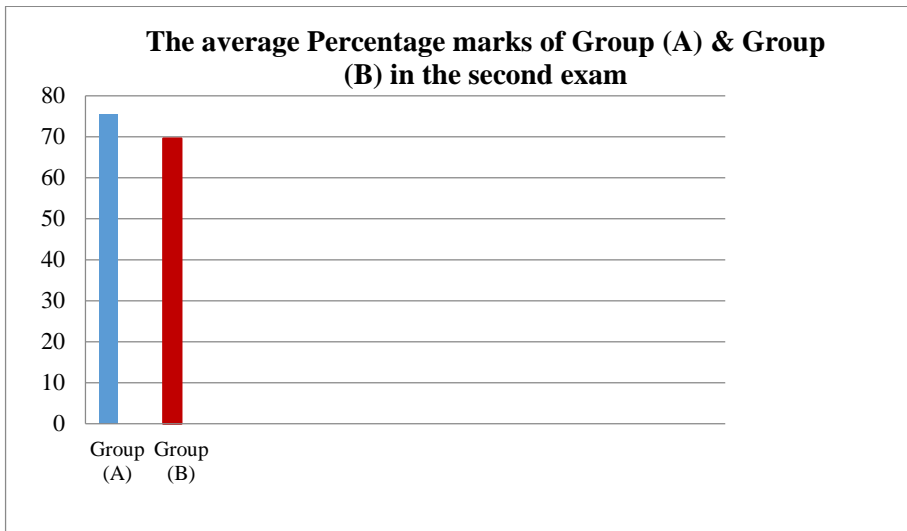
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**Chart (1)**

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The average percentage marks of groups (A) and (B) shows on chart (1) is a comparison between the words learning in both groups in a specified time period. The learners learned English words by a different method in a month. They participated for four weeks and 12 hours in the classes for learning 60 vocabularies. In group (A) sees English vocabularies learning progress than group (B) because of the average marks of group (A) is 86.5% and group (B) is 79%. The average shows that Power point and Leitner's box have positive effects on improving long term memory. The teacher can use it to present materials, then have a slide show that has discussions, questions and break the class up into groups and also the Leitner box itself is making use of the principle of spaced repetition which is a good vocabulary trainer.

**Chart (2)**

The average percentage marks of learning vocabulary in two classes on forty learners in the second exam illustrated on chart (2).

The learners group (A) received 75.5 % because they memorized the vocabulary by Leitner box.

A flash card is a cardboard consisting of a word and a simple picture on it. It should be noted that the letters on it must be visible and large enough for everyone sitting in the front and the back of the classroom. To make sure that everyone can see the letters on the card. Vocabulary flash card can be fun, colorful, and a creative way to aid in memory and retention of vocabulary words. On one side, the new word is written in L1 and the other side is the picture of the word.

Leitner's learning box and its vocabulary flash cards can motivate the students to learn English so as to be more interested in learning vocabulary and enhance their vocabulary knowledge. The teacher used Power point to introduce new words as an innovative technique in order to improve the students reading skills .it gives them a chance to see the real world by using authentic material and it is possible for the teacher to have a more

interactive class by using Ppt. Foreign language teaching is challenging so the teacher needs to involve the students by using different methods and techniques in the learning process. During this process the teacher has also to develop a positive motivation, encouragement, and attitudes in each student toward the learning process. But learners group (B) has acquired 69.6 % marks in the second exam. They learnt English words by GTM.

This method is a method which was originally used to teach dead language. One reason students cannot recall the vocabulary very well is that they don't have sufficient opportunities for practice and certainly to the extent that learners are silently studying lists of words and grammar rules; their speaking time is necessarily limited. But there is no reason that the grammar translation method cannot be used as a supplement to a more communicative approach. So, we observe minor improvement through learners of group (A) on this exam.

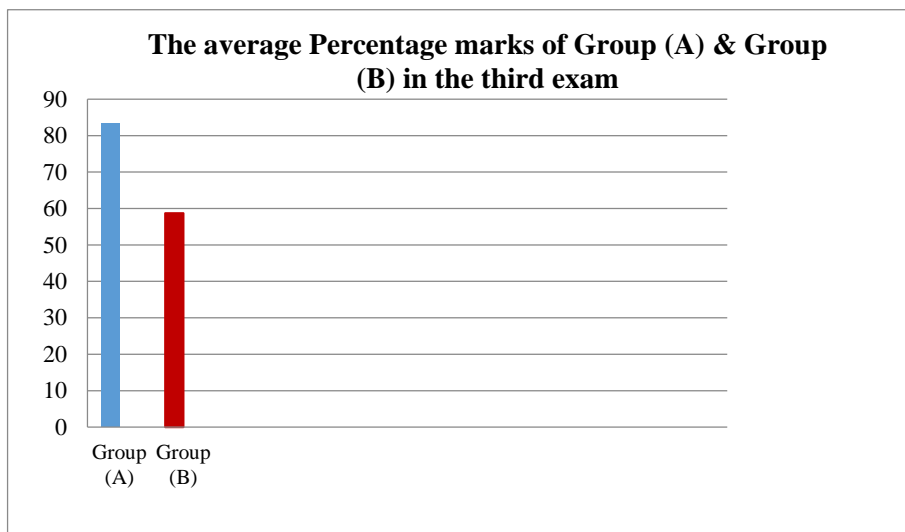


## Main findings

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### Chart (3)

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The chart (3) shows us comparative learning English vocabulary of two groups (A & B) within 12 weeks and 36 hours in classes. This chart proves that visuals tools as Ppt and picture and also the used of Leitner box and imagination were useful effects in learning language. The last exam result shows us the learners group (A) passed the exam with 83.4% and learners group (B) passed the exam with 58.7% score.

1) These percentages prove that learners of first class have significant progress on vocabulary learning after three months. They can remember the words better than the learners of second class.

2) This progress shows that Ppt and Leitner box tools have positive effects on the learning of the learners in three months.

3) Teacher finds that Ppt helps to direct the student's attention. She teaches English words and the real learning experience is actually doing class exercises and student participation. She can easily insert videos, pictures and even games for reviewing materials. So, Ppt can be an effective and powerful communication tool.

4) The learners often forget words which learnt that why teacher wants to create a good power point for helping to learn them. Additionally, it helps students learn and also can help students to better understand the complexities of the words. She teaches her students how to improve their speech by Ppt. The aim of the teacher is to teach to them to think and evaluate, to be able to decide what is important enough to learn. For better vocabulary learning, the teacher forces the learners to practice by the Ppt.

5) Although students of group (B) learn these words by GTM . This study finds that the learners cannot remember the words which they learnt after a long time, because they emphasize on the rules rather than the meaning and understanding of the words. In addition, they don't have repeated practice of the words. In fact, they learn by rote, that why they forget the words after some time.

6) This study shows that it is possible to improve long term memory of learners while learning English words. The memories are encoded and strengthened every time with practice and more

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practice makes the bonds between the surrounding cells increasingly stronger and gets more neurons involved.

7) Students can improve their long term memory by participating in activities that they enjoy and recollecting such memories through Ppt and Leitner's box games

## Chapter 6

## Conclusion



### Final Thoughts

After many decades of being neglect and receiving little importance, teaching and learning second language (L2) vocabulary has now markedly become into the focus of interest of many applied linguistic researchers and language teachers (Barcroft, 2004; Decaricco, 2001; Read, 2000). Moreover, lexical competence is currently acknowledged to be a core component of communicative competence by many vocabulary specialists, which provides much of the basis for how well learners speak, listen, read and write (Coady & Huckin, 1997; Richards & Renandya, 2002). In the past, it was thought that vocabulary could simply be learned effortlessly, and received only incidental attention in many textbooks and language programs. However, mastering vocabulary is one of the most challenging tasks that any learner faces when learning a foreign language and, thus, many language learners devote a great deal of time on memorizing lists of L2 words and rely on their bilingual dictionary as a basic communicative resource; furthermore, they consider L2 acquisition as essentially a matter of learning vocabulary. The Languages Learning Area is an essential part of a broad and balanced education for all learners. Learning another

language extends the cognitive and conceptual development and problem-solving skills of learners. It focuses on the ability to interact orally in the target language and involves comprehension and production. Learners initiate interaction and respond to the language used by others in combination of listening, speaking and viewing. For some learners and for some languages, listening and speaking skills may develop at a faster rate than reading and writing skills. Language is a powerful tool for communicating with other people and making them understand your point and How you feel!

There is a lot to learn about vocabulary in terms of its range, the sheer number of words and phrases to learn, and students' knowledge needs to have about each vocabulary item. Materials can help students in two broad areas: first, they need to present and practice in natural contexts the vocabulary that is frequent, current, and appropriate to learners' needs; second, materials should help students become better learners of vocabulary by teaching different techniques and strategies they can use to continue learning outside the classroom. A lot of vocabulary learning research points to the relative success of learners, who are independent, devote time to self-study, use a variety of learning strategies, and keep good vocabulary notes. Teachers can help students to be better learners and acquire good learning habits by setting structured learning tasks that can be done out of class. Materials should give space to personal learning logs, like Leitner's box, and encourage students to continue learning outside class. Students now have access to vast resources such as the Microsoft PowerPoint, Leitner's box, and pictures. If students are trained to use these resources and understand how they can provide information on improving long-term memory, they can exploit these resources more effectively and become more independent in their learning. Materials can also provide students with ideas to activate and practice vocabulary in their everyday lives, which is especially useful for students who live in non-English-speaking environments. When students watch Microsoft

PowerPoint and pictures, multiple areas of their minds become engaged and active. In this research, we test whether using Microsoft PowerPoint, picture, imagination, and Leitner's box in an English course enhances students' long-term memory and attitudes toward class presentation and the instructor.



## **Final Result**

Thus, before boys or girls are born, their brains are developed with different hemispheric divisions of labor. The right and left hemispheres of the male and female brains aren't set up exactly the same way. For instance, females tend to have verbal centers on both sides of the brain, while males tend to have verbal centers on only the left hemisphere. This is a significant difference. Girls tend to use more words when discussing or describing incidence, story, person, object, feeling or place. Males not only have fewer verbal centers in general but also, often, have less connectivity between their word centers and their memories or feelings. When they have to remember the vocabularies, girls tend to have an advantage, and they tend to have more interest in talking about many things. The brain is often likened to a muscle; learners can strengthen their mind by repeating over and over to themselves. Students might be able to remember certain things that they learnt during the previous weeks. Those things that they were able to remember about last week are stored in long term memory. If learners improve their long term memory, they can store information in their memory for a long time. This is in contrast to short term memory, which can only hold between 5 and 9 items for 20 to 30 seconds. The tools as Ppt, imagination, pictures and Leitner box help learning students in their memorization. These tools help them; learn English vocabularies as (FL) with their long term memory. This research proves that these tools improving learner's memory in learning many things for life time.





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